ATOMIC ENERGY *letter*

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Dear Sir:

Contract authority for $78,885,000.00 has been given the U. S. Atomic Energy Commission for 1950 fiscal year spending, with the signing last week by President Truman, at Key West, of the enabling deficiency appropriation bill. The grant is supplemental to the $947 million recently approved for the AEC for fiscal 1951. It provides $1,485,000.00 for additional construction for the weapons program (70% of fiscal 1951 funds are directly related to weapons), and $2,000,000.00 for architect-engineer services for a new nuclear reactor at Arco, estimated cost of which is $20 million, and which will be similar to the materials testing reactor there. The bill makes available an initial $500,000.00 for the new $5 million heavy water production plant (AEN 3/28/50, p.2), and provides partial funds for the $188,594,000.00 enlargement program at Hanford and Oak Ridge.

The U.S.'s expanded thermo-nuclear (fusion) weapons production program (the subject of Washington discussions last week by AEC officials and the Joint Congressional Committee on Atomic Energy), will have some projects underway this year as soon as certain basic materials are produced and available. This weapons concentration will delay the intermediate power-breeder nuclear reactor (KAPL-I) at the General Electric-operated Knolls Atomic Power Laboratory, West Milton, N.Y. The construction of this reactor, which was scheduled to begin this Spring, and one of the main objectives of which was to generate heat, at high temperature, for conversion into electrical energy, has been temporarily deferred, the AEC said in Washington last week. Postponement will enable G-E to "firm up" drawings and specifications so that a larger part of the construction work can be let out on bids than would have been possible under the original time schedule. Meanwhile, studies at Knolls Laboratory continue on an intermediate energy, liquid metal cooled nuclear reactor for ship and submarine propulsion (KAPL-II).

Radioactive contamination of seas and shores by nuclear energy powered vessels should be part of the overall pollution studies of the U.N.'s Transport and Communications Commission, the U.S. suggested to that body last week, at Lake Success. The suggestion was advanced at the specific request of the U.S. Maritime Commission, who stated that rapid progress being made in that field makes the subject highly pertinent. Now, under a contract negotiated with the Electric Boat Co., Groton, Conn., leading builder of submarine craft, that company will investigate problems caused by the use of a nuclear reactor in a submarine hull: high neutron emission in an underseas craft, etc. The first land based prototype of this submarine nuclear reactor (development model only) is now being developed jointly by Westinghouse Electric Corp., at Bettis Field, Pa., and Argonne National Laboratory, Chicago. A very high priority has been accorded the project, which may go into the construction phase at Arco late this year; $26,000,000.00 have been allocated to it for fiscal 1951.

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AT THE ATOMIC CITIES & CENTERS IN THE UNITED STATES...

RICHLAND, Washington- Chemical separation facilities (extraction of plutonium from uranium metal rods after pile irradiation) at Hanford Plutonium Works, will be expanded under the enlarged plutonium output program now in effect here; approximately $700,000.00 will be spent for the work. For improvements in existing chemical separation facilities, to increase their capacity, $300,000.00 has been allocated. In the plutonium pile areas, certain critical components of the pile piping system will be replaced with piping of corrosion-resistant alloys. Automatic valve equipment is to replace manual control of the flow of water from the high tanks in this pile area. It is also proposed to redesign and replace the existing pile loading equipment with machines which can reduce charging time and delays. Improvements to cost $280,000.00 are also to be made to the pile control facilities, while improvements in the pile safety facilities will call for a $150,000.00 expenditure. In addition, repairs will be made to the irradiation shield of one of the piles, at a cost of $270,000.00.

Other projects scheduled for Hanford Works include a $300,000.00 process water treatment and filter plant; a $125,000.00 process water diversion facility to treat effluent, and improved gas handling facilities in the pile areas, to cost $150,000.00.

LOS ALAMOS, New Mexico- Advance planning and preliminary design work (for the research projects and general construction to be initiated here during fiscal 1951) will involve approximately $605,000.00 in architect-engineering fees. Now, seven architect-engineers are working on various phases of the construction program here: Holmes & Narver (also engaged in preparing the Eniwetok Atoll atomic proving ground for the forthcoming tests); Ralph M. Parsons & Co.; Black & Veach; Skidmore, Owings & Merrill; Max Flatow; and Kistner, Curtis & Wright (who did the community and technical architect-engineer work at the Salton Sea, Calif., weapons test base).

SANDIA BASE, Albuquerque, New Mexico- The four year basic construction program to replace and expand the AEC's facilities, and its Western Electric-operated Sandia Laboratory, here at Sandia Base(the atomic weapons engineering and assembly center) is now at its peak, and will be largely concluded by July 1st, of this year. Technical area construction will then represent an investment of $25,000,000.00, with $7,000,000.00 put into community facilities. Only a few contracts remain to be let. Noteworthy is that the construction program was accomplished without critical interference with the established atomic weapon production schedules.

OAK RIDGE, Tennessee- Installation of permanent decontaminating facilities, to handle decontamination of all equipment which may be removed for repair from the diffusion cascade, is planned for the K-25 uranium-235 production unit here. It will replace present decontamination facilities which are pilot plant in size and capacity. The new facility will handle all sizes of equipment (valves, pumps, barriers, etc.), and enable the recovery of enriched uranium from plant surfaces without endangering the process operators. Chemical process equipment will also be installed for recovering the uranium from the decontamination solutions so that it may be returned to the cascade for production purposes; special equipment is to be provided as well for decontaminating stage seal pumps. Cost is estimated at $100,000.00.

Proposals have now been invited by the AEC here for construction of a new bulk shielding facility at the Oak Ridge National Laboratory. Invitation no. 401-50-12A has been issued for the facility whose main structure will be 77x33x39-feet, and which will house a concrete pool 40x20 feet, and 24 feet deep. Bid closing date is May 1st, 1950.

ARCO, Idaho- Negotiations are now in progress here by the U.S. Corps of Engineers for formal acquisition of the balance of the 440,000 acres of public and private land which comprise the nuclear reactor testing station here (the original 172,000 acres of the old Naval Proving Ground have already been transferred to the AEC). All of the land will be used for technical purposes; none will be allocated for dwelling sites or business establishments.

NEW PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear work...

INSTRUMENT NEEDS of the AEC for fiscal 1951 (starting July, 1950) include the expenditure of $150,000.00 by the AEC's New York Operations Office for radiation detection instruments and components. In addition, the AEC's Radiation Instruments Branch, Washington, D.C., will spend $100,000.00 (directly and through local operations offices) for specific radiation detection instruments, or allied equipment, for the general requirements of the whole AEC; in most cases these contractual expenditures will be for devices or components which are integral parts of complete radiation detection instruments or systems, such as special detector components, electrometer tubes, etc. At Oak Ridge, to build up a stockpile of 750 radiation instruments for the use of radiological and survey teams in defense of the area there, $19,000.00 will be spent. Approximately $6,500.00 will also be spent at Oak Ridge to build radiation survey instruments which are not commercially available; this compares with $65,000.00 spent for that purpose in fiscal 1949.

SCIENTIFIC LABORATORY EQUIPMENT PURCHASES in the atomic energy program, for fiscal 1951, will total $376,605.00 at Brookhaven National Laboratory, L.I., for such items as balances, counting equipment, microscopes, ovens, monitoring survey instruments, oscilloscopes, potentiometers, centrifuges, etc. The AEC's New Brunswick, N.J., laboratory, expects to spend $31,000.00; Oak Ridge, $10,000.00, plus $28,000.00 for meteorological equipment; and the New York radiological laboratory, $20,000.00.

PROPOSALS to furnish 30 Geiger-Muller tubes have been asked by the Chemical Corps Procurement Agency, Army Chemical Center, Md., under invitation no. 425; bids close April 21st, 1950.

NEW PRODUCTS: An improved version of its portable radioactive prospecting instrument, the model 2301 provides visual indication by neon flashing, and headphones. Powered by two, 1½-volt, flashlight cells; access to battery compartment by snap cover on end of instrument. Sensitivity to betas increased by beta window on bottom. Uses new, thin wall, stainless steel Geiger counter. New circuit.--Nuclear Instrument & Chemical Corp., Chicago 10.

A new, inexpensive, paper-like filter material has been designed by Arthur D. Little, Inc., Cambridge, for the AEC, to filter fine radioactive particles from contaminated gaseous wastes. The material may have industrial uses in commercial filtering, for stack gas apparatus or ventilating air devices for biological laboratories or hospital operating rooms. The new material contains treated paper-making fibers, in combination with finely divided mineral asbestos fibers, and is made in soft, flexible sheets which can be pleated and formed into shapes to fit large capacity filtering units.

NEW BOOKS & OTHER PUBLICATIONS...in the nuclear field...

The Story of Atomic Energy, by Frederick Soddy. Reprint of articles which appeared originally in "Engineering" (England) during 1947 & 1948. An account, intended for non-scientists, of the work which led up to some understanding of nuclear structure. 136 pages.--Nova Atlantis, London, (20 s.)

Chemical Assaying for Uranium (cellulose column method). Modification of cellulose column method developed at the Chemical Research Laboratory, Teddington, England. Published as Memorandum, series 105. Available from Mines Branch, Department of Mines & Technical Services, Ottawa, Canada.

First Principles of Atomic Physics, by Richard F. Humphries & Robert Beringer. A text for students who will take but a single college course in physics.--Harper & Bros., New York 16. ($4.50)

Isotopes; Supplement No.3. Beta-ray applicators, isotope labeled compounds, isotope price revisions, etc.--Isotopes Division, AEC, Oak Ridge, Tenn.

Medical Aspects of Atomic Weapons. Injurious results of an atomic bomb explosion, and how to protect people and structures. 24 pages. Superintendent of Documents, Washington 25, D. C. (10¢)

Locating Mining Claims on the Public Domain. A digest of Federal laws. Covers fissionable material, among other subjects. Circular no. 7535. --Publications Section, Bureau of Mines, 4800 Forbes St., Pittsburgh 13, Pa.

ATOMIC PATENT DIGEST...latest U.S. & British applications & grants...

Additional patents (15), U. S. Government-owned (assigned to AEC) are now available to interested manufacturers; royalty-free (but non-exclusive). This latest group brings to 104 the total of such patents now available. (For previous listings, see AEN 2/28/50 & 5/14/50.) For licenses, apply to Chief, Patent Branch, USAEC, Washington 25, D.C.: No. 2,494,641, Improved beta ray counter; No. 2,494,834, Mounting of specimen; No. 2,494,968, Preparing alkoxy borohydrides; No. 2,495,081, Packless valve; No. 2,495,497, Liquid stabilization of nickel catalysts; No. 2,495,650, Coincidence proportional counter; No. 2,496,115, Stabilizing perfluoro oils; No. 2,496,123, Ionization chamber; No. 2,496,819, Pulse generator; No. 2,496,886, Radiation alarm & measurement device; No. 2,497,823, Radiation measuring device for air filters; No. 2,498,841, Ion source; No. 2,499,288, Vacuum analyzer; No. 2,499,289, Ion generator; No. 2,499,320, Ion generator.

New U.S. PATENTS GRANTED (with applications)-Artificial atomic disintegration. A method of causing fission by subjecting a member of the group consisting of uranium and thorium to bombardment by gamma rays only having an energy above 6 Mev. U. S. Pat. No. 2,500,223, issued Mar. 14th, 1950; assigned to Westinghouse Elec. Corp., E. Pittsburgh.

Geiger-Muller counter structure. A detecting element for a radiographic exposure meter. Essentially a cathode (of a G-M counter) having an active surface containing a photosensitive silver halide. U. S. Pat. No. 2,500,941, issued Mar. 21st, 1950, to H. Friedman, Arlington, Va.

Radioactive measurement of the thickness of a wall, by measuring the quantity of radiation from radioactive selenium transmitted through the wall. U. S. Pat. No. 2,501,174, issued Mar. 21st, 1950; assigned to the Texas Co., New York.

Determining the distribution of radioactive matter, in a sample containing radioactive and non-radioactive material, by separately measuring at least two types of radiation from the sample. U.S. Pat. No. 2,502,136, issued Mar. 28th, 1950; assigned to General Electric Co., New York.

Analyzing fluocarbon compositions, for hydrogen, by measuring the sample's fluorescense under ultra-violet light. U. S. Pat. Application No. 631,420, made by H. M. Haendler and L. M. Burger; assigned to the United States of America (USAEC).

RAW MATERIALS...radioactive ores & other essentials for nuclear work...

UNITED STATES- The mining program expansion of the AEC, for fiscal 1951, in the Colorado Plateau area, will involve the expenditure of $500,000.00 for raw material pilot plants; $300,000.00 for modifications and maintenance at one ore refinery, and $175,000.00 for dismantlement of a plant producing green salt of uranium (a new plant is being erected). The concerted effort to reduce health hazards at waste recovery, uranium metal working, and ore refinery facilities will continue...Identification of three hitherto unknown uranium minerals has been made by the U. S. Geological Survey. The new minerals, named andersonite, swartzite, and bayleyite, by USGS geochemists, were found in a coating in gypsum on the 300-foot level of the Hillside Mine in Yavapai County, Arizona, together with schroeckingerite, another rare uranium mineral. The occurence was in only one place, however: as a coating about 1/8-inch thick, on gypsum, in the oxidized zone, and about 40-feet above the water level.

BRAZIL- the exportation of monazite sands in the natural state to the United States at $200.00/ton has recently been protested in the Brazilian Congress. In 1949, 2,500 tons of these sands are said to have been shipped to the U.S., with all shipping contracts approved by the National Security Council. In addition to thorium and ilmenite, the sands contain cerium, the value of which is five times that of the sands. Contributing to the controversial aspect of the situation is the fact that monazite sands enter the U.S. free of duties, whereas cerium pays 35% ad valorem.

PORTUGUESE EAST AFRICA- A new source of uranium ore is said to have been discovered here at Tete. Reportedly, the deposit has been worked on a small scale, and the output sold under contract to the French Government.

RADIOISOTOPES...as used for therapy and tracer applications...

Using radioactive dithiophosphate synthesized from radioactive phosphorous, a study was made of a typical mineral collector system, dithiophosphate galena, in work at the Stamford Research Laboratories, of the American Cyanamid Co., by G. L. Simard, J. Chupak, and D. J. Salley. The experimenters state that radiotracers were found of considerable value, since they provide a rapid and sensitive analytical method, especially applicable to the conditions of flotation and enable measurements to be made of the rate of uptake, the isotherms, the desorption, and the exchange of dithiophosphate.

The effect of radioactive phosphorous (P-32) on the growth of the albino rat has been investigated by M. M. Kligerman, Temple University Medical School, Philadelphia. He found that radioactive phosphorous retards normal weight gain in 21 day old albino rats; that doses as small as 44 microcuries/kg. caused the retardation. In quantities of 132 microcuries/kg., the growth of bone was retarded. These effects of P-32, on the growth of the albino rat (weight and long bone), cease as soon as the P-32 concentration in the body falls below a threshold value. This level is reached within 42 days after the last dose is given.

The production of malignant tumors in rats with radioactive phosphorous (P-32) has been studied by S. Kaletsky, F. J. Bonte, and H. L. Friedell, at Western Reserve University School of Medicine, Cleveland. Of thirteen tumors observed in rats injected with large doses of radioactive phosphorous, ten were osteogenic sarcomas situated most frequently in the jaw, and also occurring in the spine, tibia, and femur. Four of the neoplasms metastasized to the lungs. The neoplasms occurred in animals which received (a) a single dose of P-32 (average latent period of 290 days), and (b) repeated doses of 1.5 microcuries per gram of P-32 (average latent period of 165 days). The incidence of tumor development was about 40%.

IONIZING RADIATION...investigations & notes...

The increased tolerance of mice to lethal x-radiation, as a result of previous sub-lethal exposures, has been investigated by E. P. Cronkite, C. R. Sipe, D. C. Eltzholtz, W. A. Chapman, and F. W. Chambers, Jr., at the National Naval Medical Center, Bethesda, Md. These investigators found that three weekly exposures of 144 r, followed by a thirty day rest period, increase the resistance of mice to a subsequent lethal dose of x-radiation. The workers note that no adequate explanation for this phenomenon is available.

Further work with cysteine, as it affords protective action to x-rays, has been done by D. E. Smith, H. M. Pratt, E. B. Tyree, and R. L. Strauble, of the Division of Biology, Argonne National Laboratory, Chicago. Previously, they had reported that cysteine, administered either orally or intravenously, prior to the exposure of rats to lethal dosage of x-radiation, greatly increases their chances for survival. In this work, experiments in which cysteine and x-ray dosage were varied over a wide range, revealed that the protective action afforded by cysteine is proportional to the dosage of cysteine employed.

The effect of zirconium and sodium citrate on the distribution and excretion of simultaneously injected thorium and radiostrontium in rats has been under investigation by J. Schubert and H. Wallace, Jr., of the Medical Division, Argonne National Laboratory, Chicago. They found that, in contrast to previous studies on plutonium and yttrium, zirconium citrate had no specific effect on thorium or strontium metabolism other than that associated with the citrate part of the molecule. However, the early administration of zirconium or sodium citrate resulted in about a 3-fold increase in the urinary excretion of thorium, and a 2-fold increase in the urinary excretion of strontium, during the following 24 hours.

Sincerely,

The Staff,
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